

THIOREDOXIN *h* CONSTRUCTS FOR TRANSFORMATION

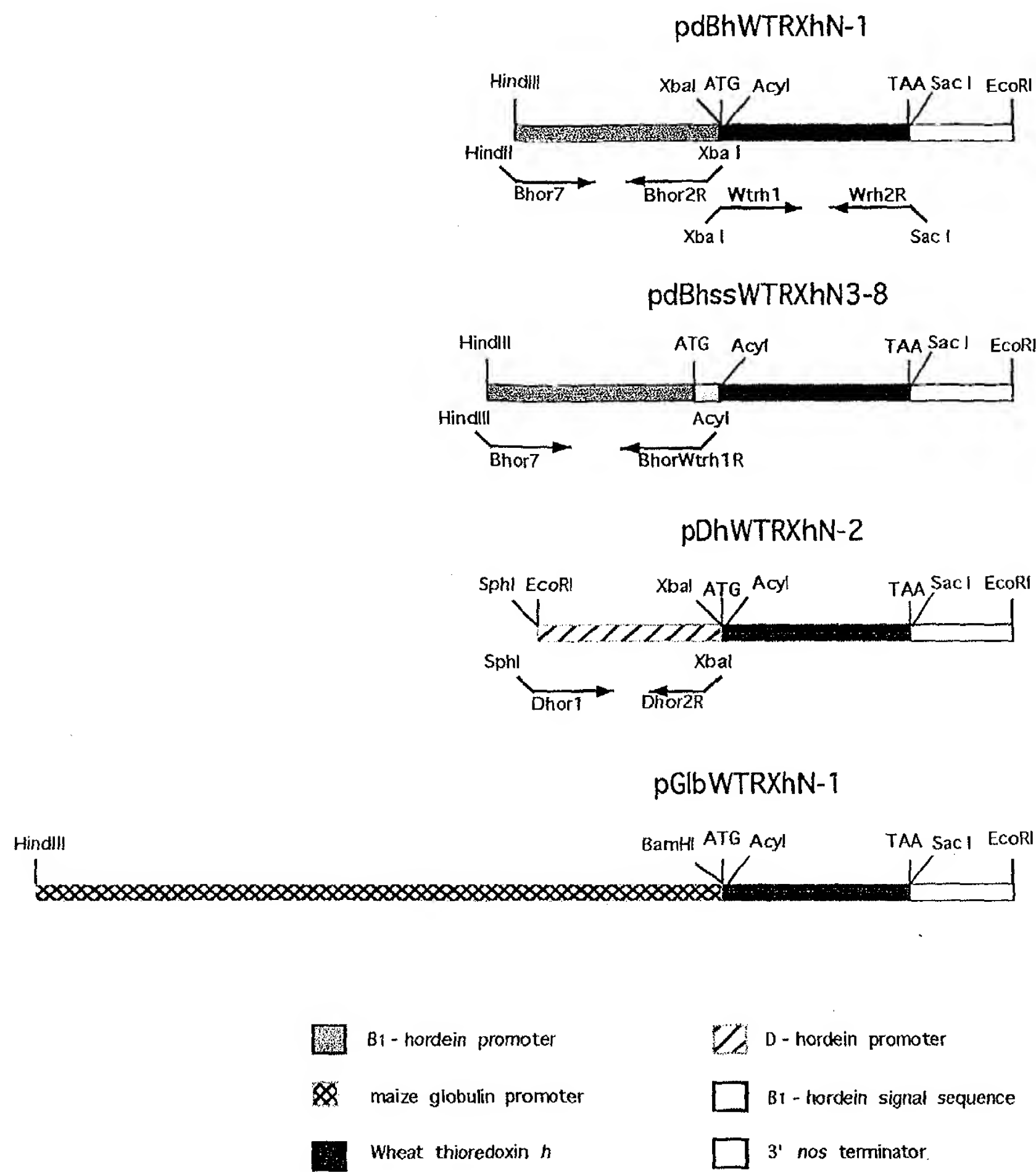
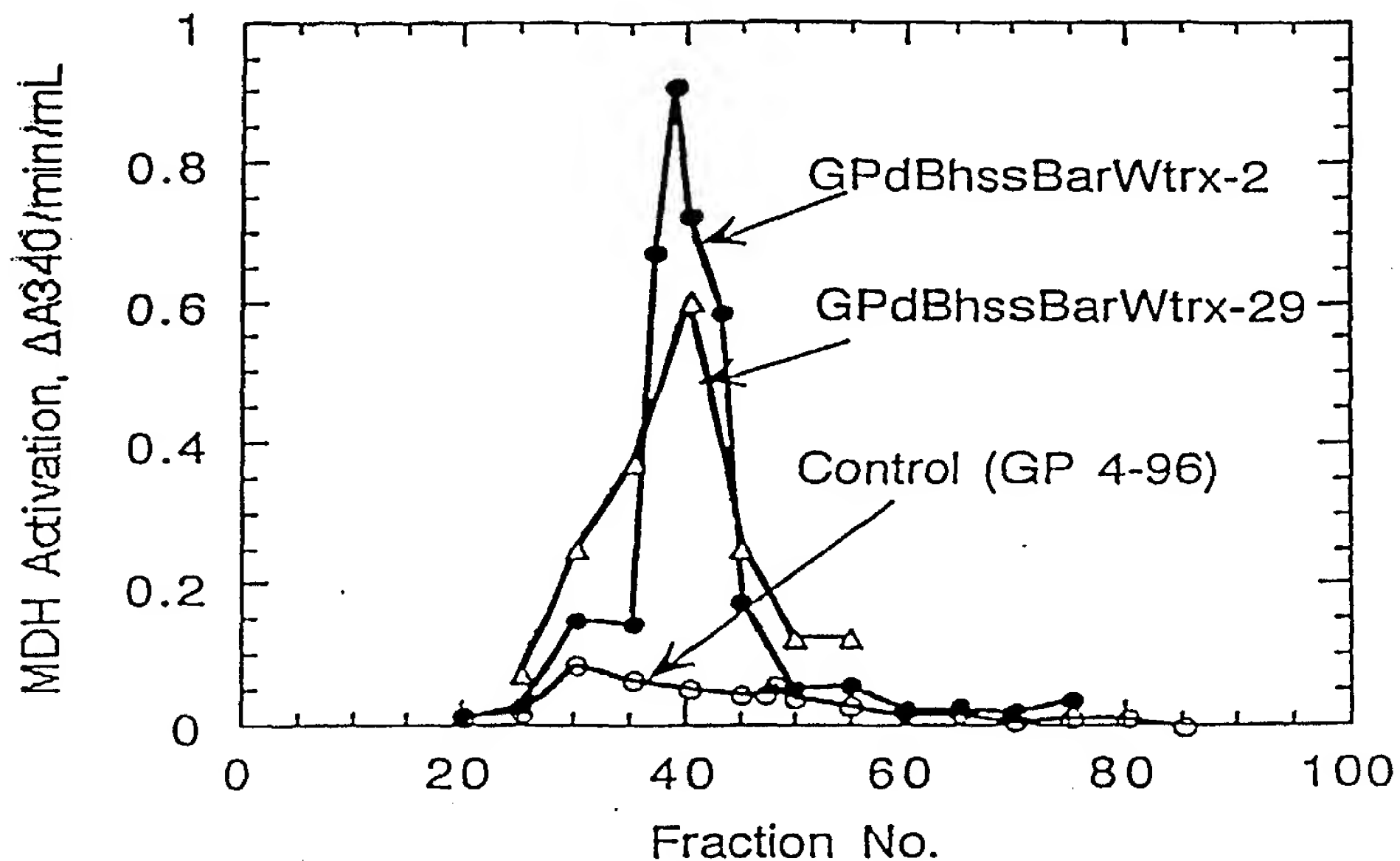


Figure 1

# Sephadex G-50 Activity Profile of Thioredoxin from Barley Grains (+MDH)



## Sephadex G-50 Elution Profile of Proteins from Three Barley Grains

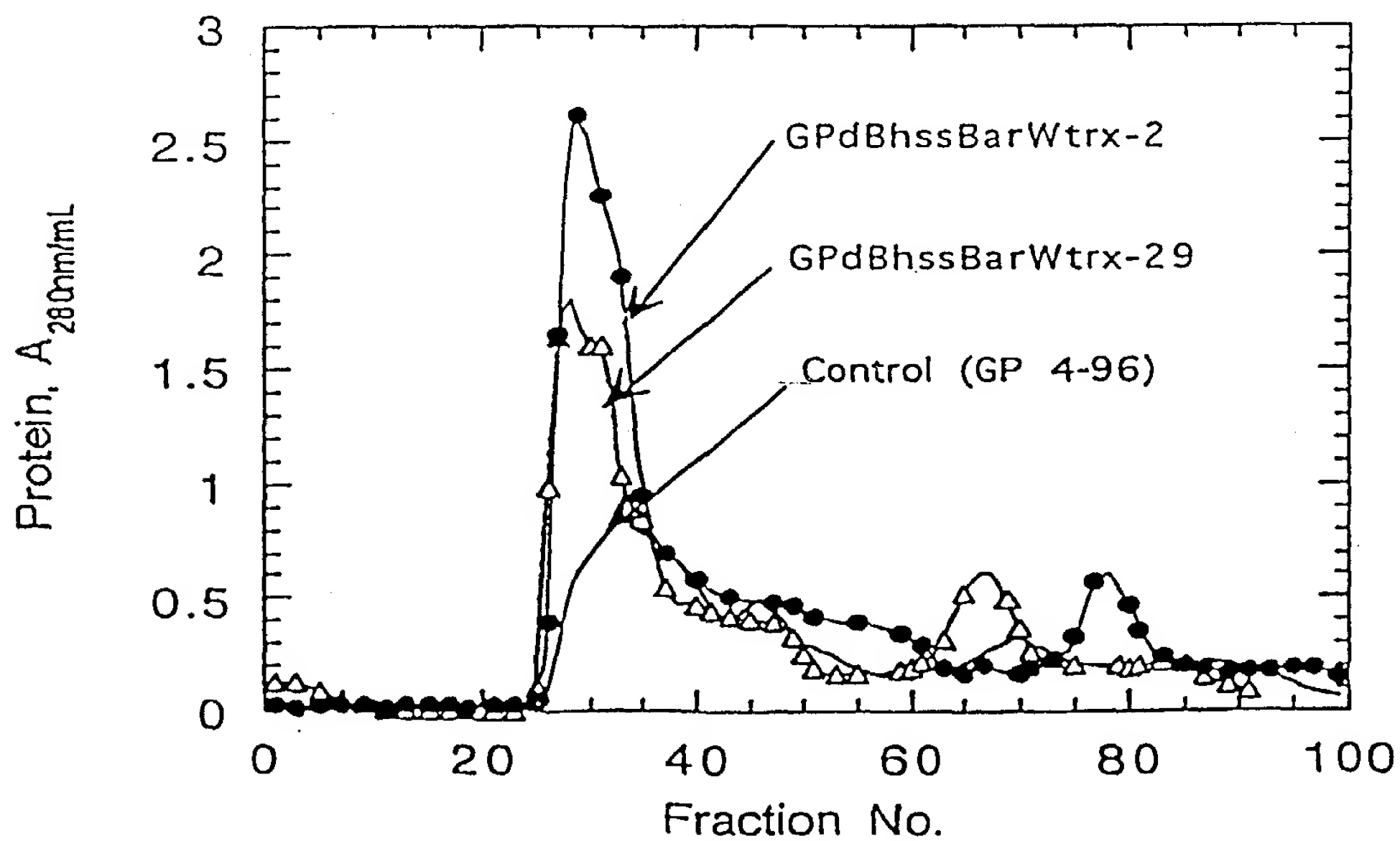


Figure 2

# Effect of Heat Treatment on Thioredoxin Activity in Crude Extracts from Grain of Control (C) and Transformed (T) Barley

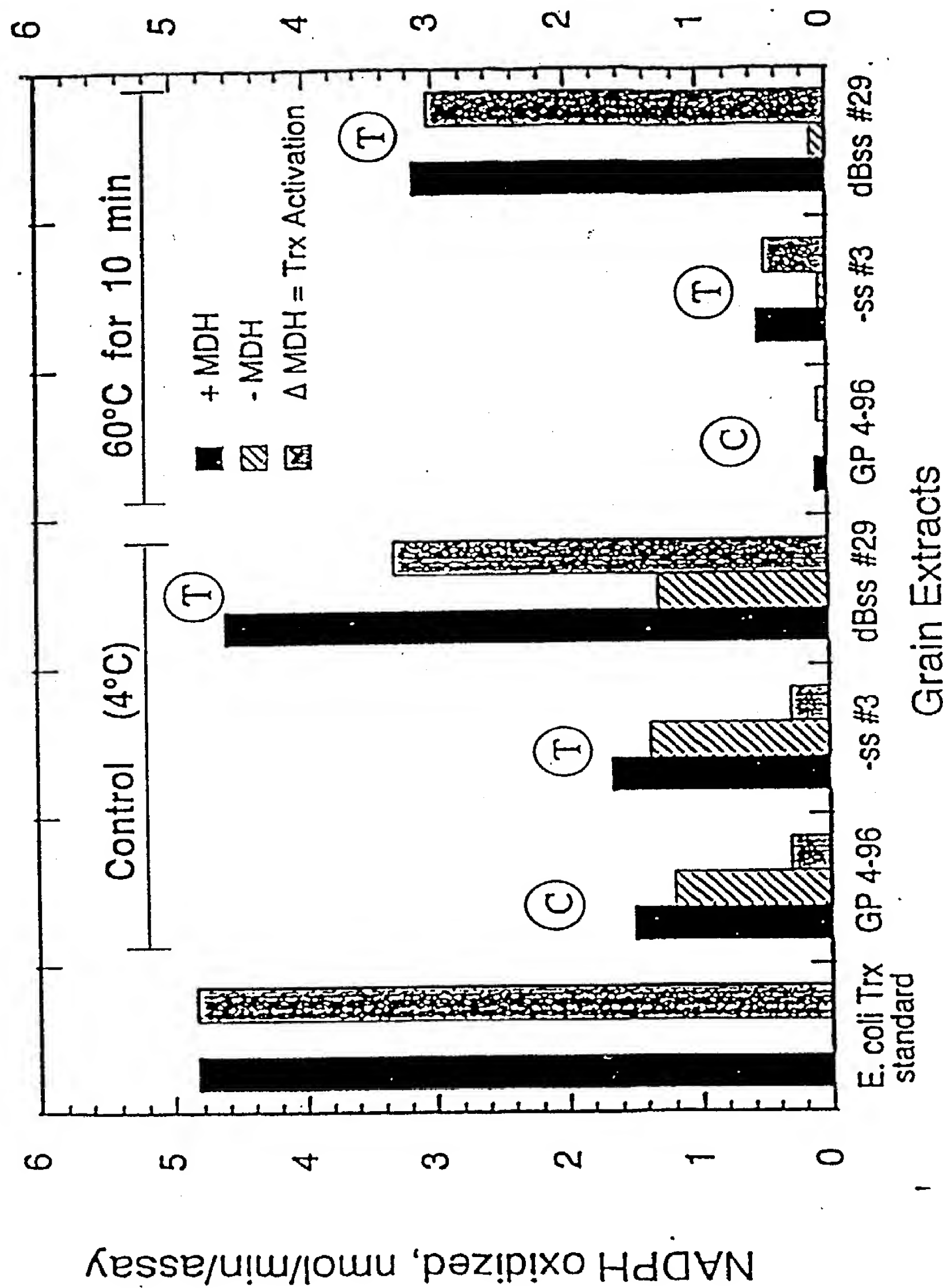


Figure 3

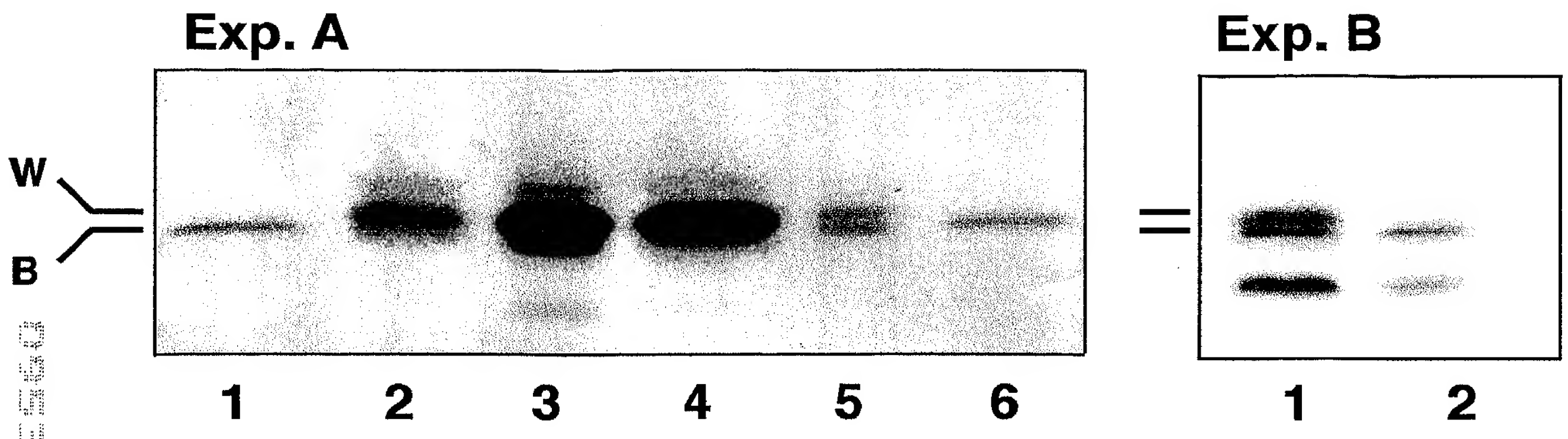
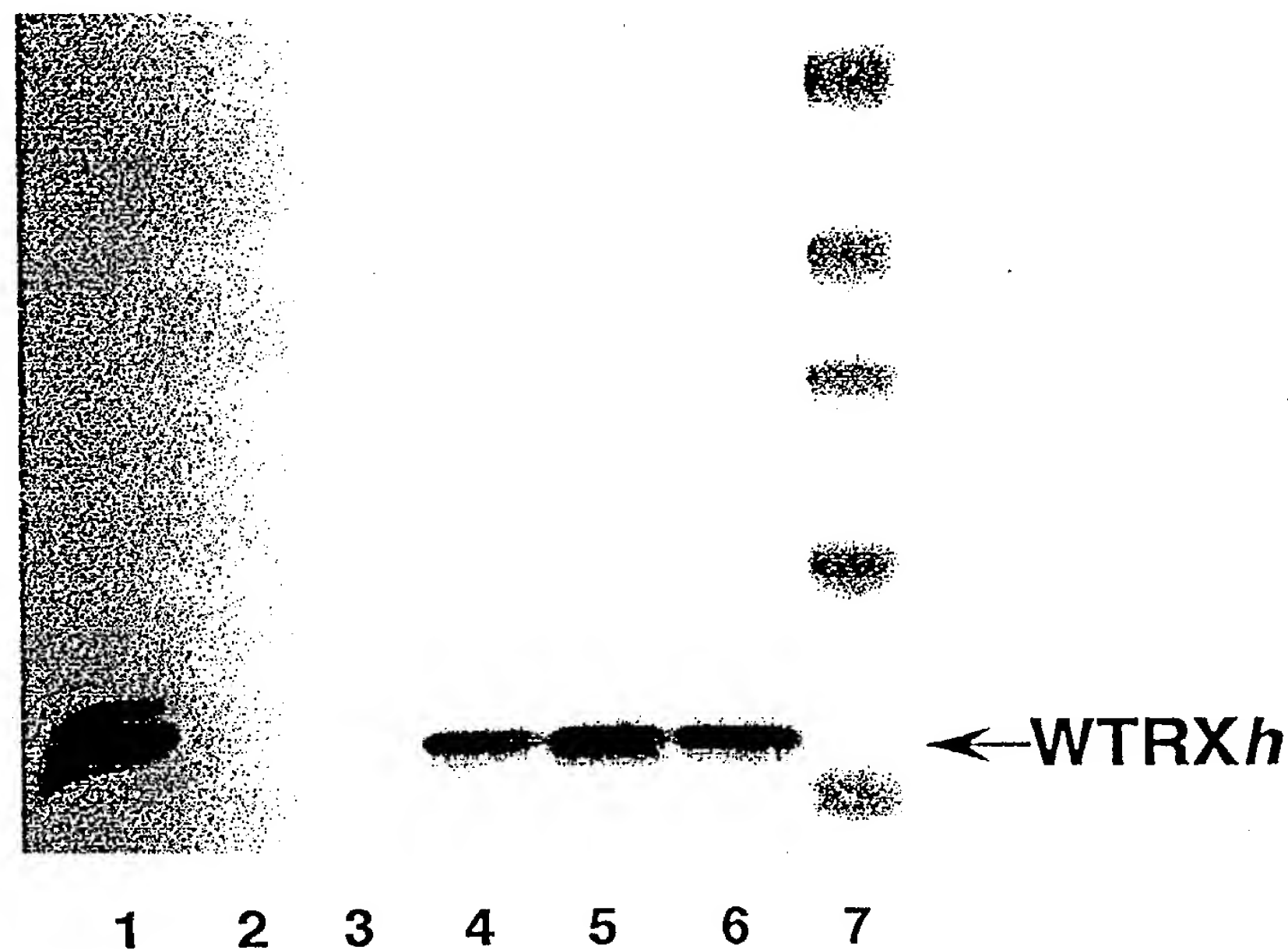


FIGURE 4

# Western Blot Analysis of Barley Grain Transformed with Wheat Thior

SDS-PAGE: cv. Golden Promise



1. Wheat germ thioredoxin
2. Control (GP 4-96), nontransformed
3. Control, null segregant (GPdBssBarWtrx-29-11-10)
4. Transformed, heterozygous line (GPdBssBarWtrx-29)
5. Transformed, homozygous line 1 (GPdBssBarWtrx-29-3)
6. Transformed, homozygous line 2 (GPdBssBarWtrx-29-3-2)
7. Prestained standards

FIGURE 5

AAGCTTTAACAACCCACACATTGATTGCAACTTAGTCCTACACAAGTTTTCCATT  
CTTGTTTCAGGCTAACAACCTATACAAGGTTCCAAAATCATGCAAAAGTGATGC  
TAGGTTGATAATGTGTGACATGTAAAGTGAATAAGGTGAGTCATGCATACCAA  
CCTCGGGATTTCTATACTTTGTGTATGATCATATGCACA'ACTAAAAGGCAACTTT  
GATTATCAATTGAAAAGTACCGCTTGTAGCTTGTGCAACCTAACACAATGTCCA  
AAAATCCATTTGCAAAAGCATCCAAACACAATTGTTAAAGCTGTTCAAACAAAC  
AAAGAAGAGATGAAGCCTGGCTACTATAAATAGGCAGGTAGTATAGAGATCTA  
CACAAGCACAAGCATCAAAACCAAGAAACACTAGTTAACACCAATCCACTATGA  
AGACCTTCCTCATCTTTGCACTCCTCGCCATTGCGGCAACAAGTACGATTGCA

FIGURE 6

CTTCGAGTGCCCCGCCGATTTGCCAGCAATGGCTAACAGACACATATTCTGCC  
AAAACCCCAGAACATAATCACTTCTCGTAGATGAAGAGAACAGACCAAGAT  
ACAAACGTCCACGCTTCAGCAAACAGTACCCCAGAACTAGGATTAAGCCGAT  
TACGCGGCTTTAGCAGACCGTCCAAAAAAACTGTTTTTGCAAAGCTCCAATTCC  
TCCTTGCTTATCCAATTTCTTTTGTGTTGGCAA'ACTGCACTTGTCCAACCGATT  
TTGTTCTTCCCGTGTTTCTTCTTAGGCTAACTAACACAGCCGTGCACATAGCC  
ATGGTCCGGAATCTTCACCTCGTCCCTATAAAAGCCCAGCCAATCTCCACAAT  
CTCATCATCACCGAGAACACCGAGAACCAAAA'ACTAGAGATCAATTCATTG  
ACAGTCCACCGAGATGGCTAAGCGGCTGGTCCTCTTTGTGGCGGTAATCGTC  
GCCCTCGTGGCTCTCACCACCGCT

FIGURE 7

000000-1985555

FIGURE 8

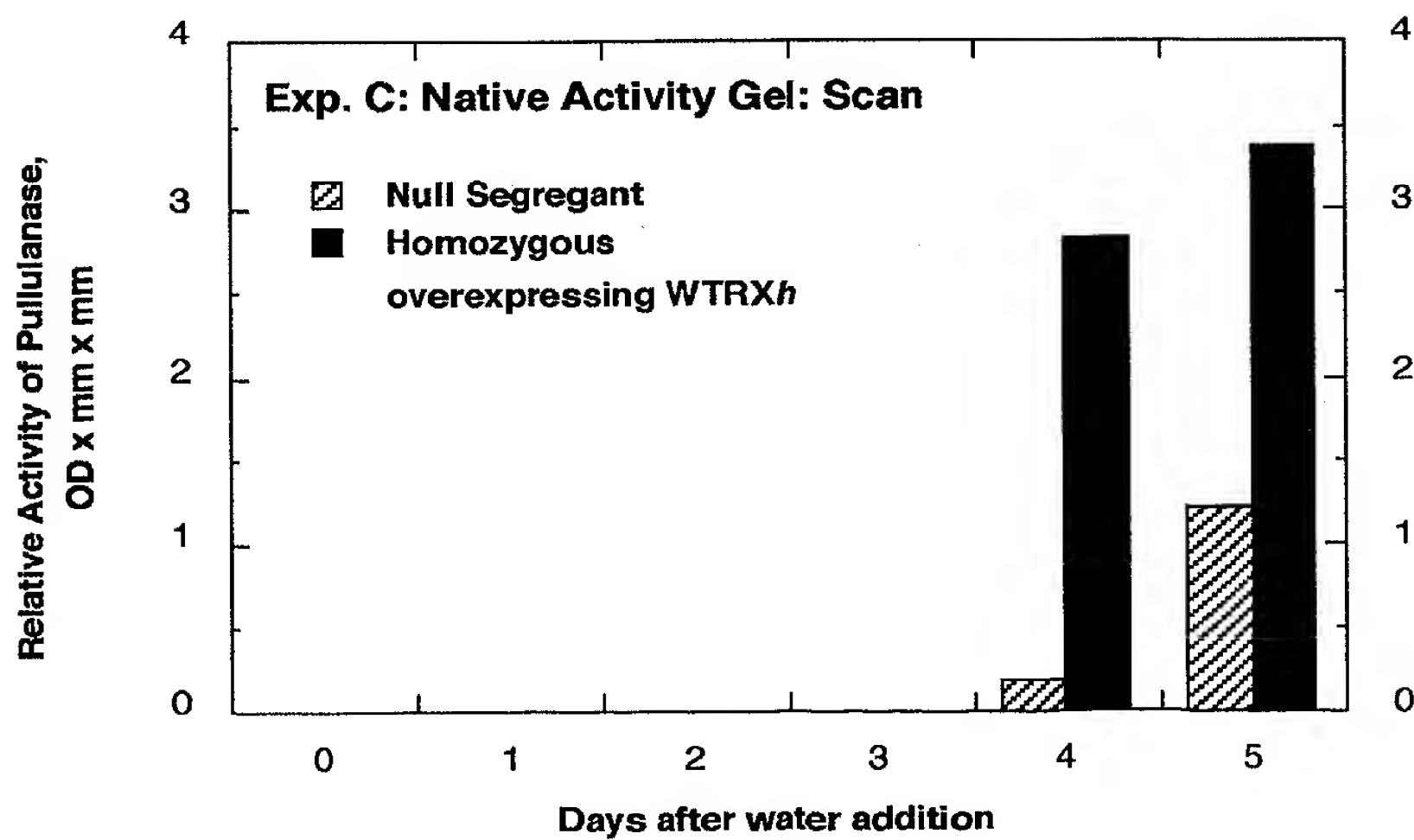
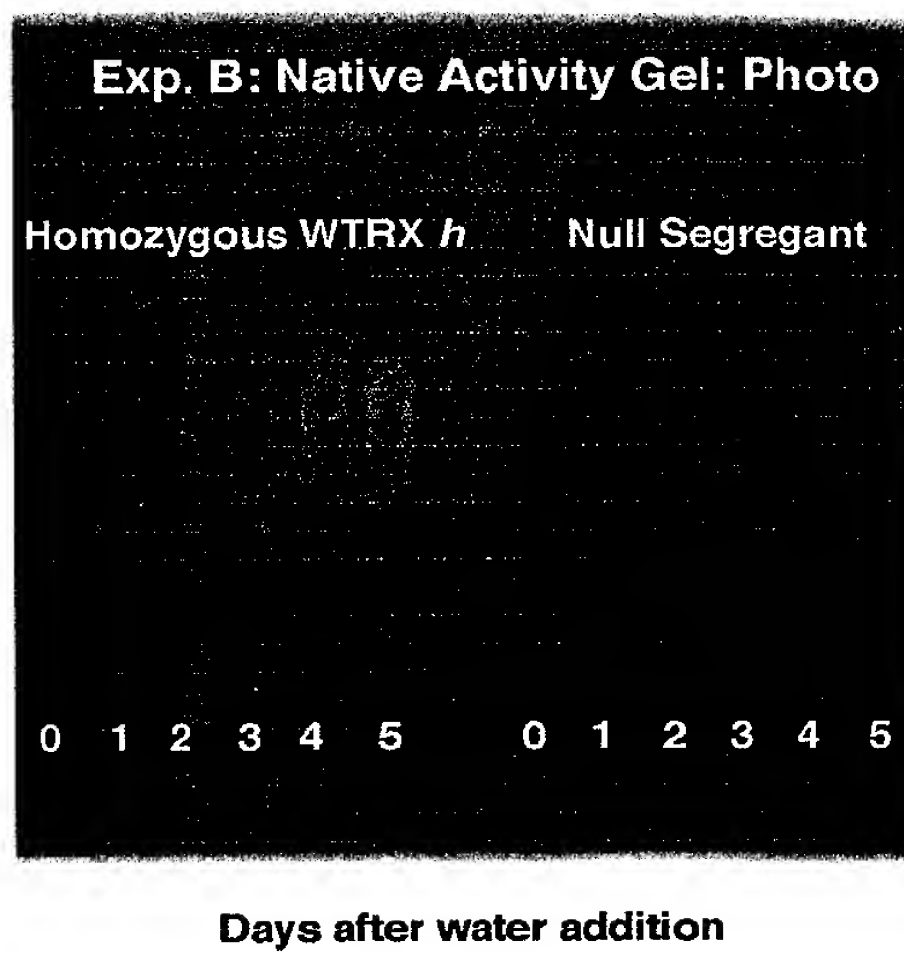
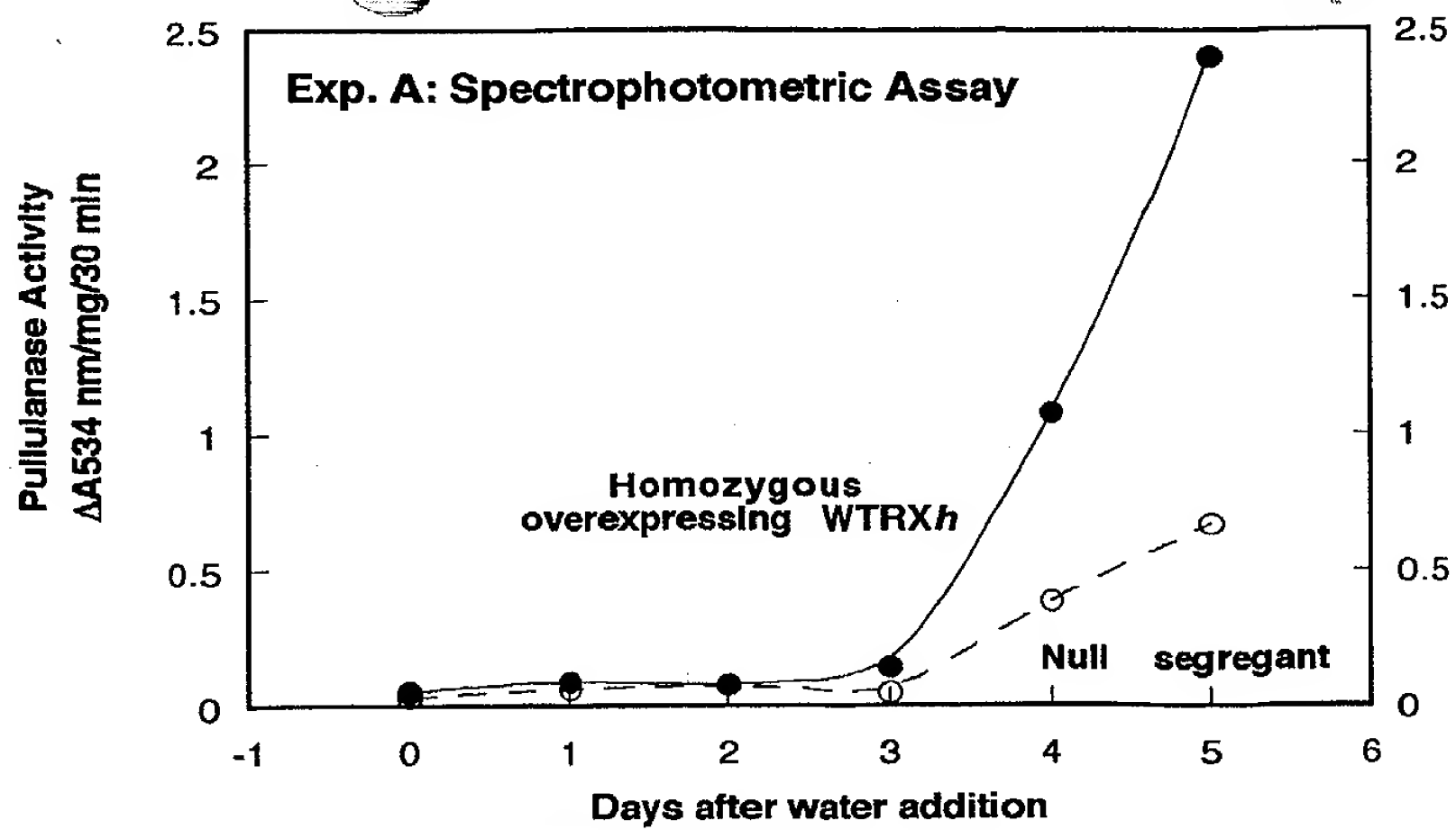


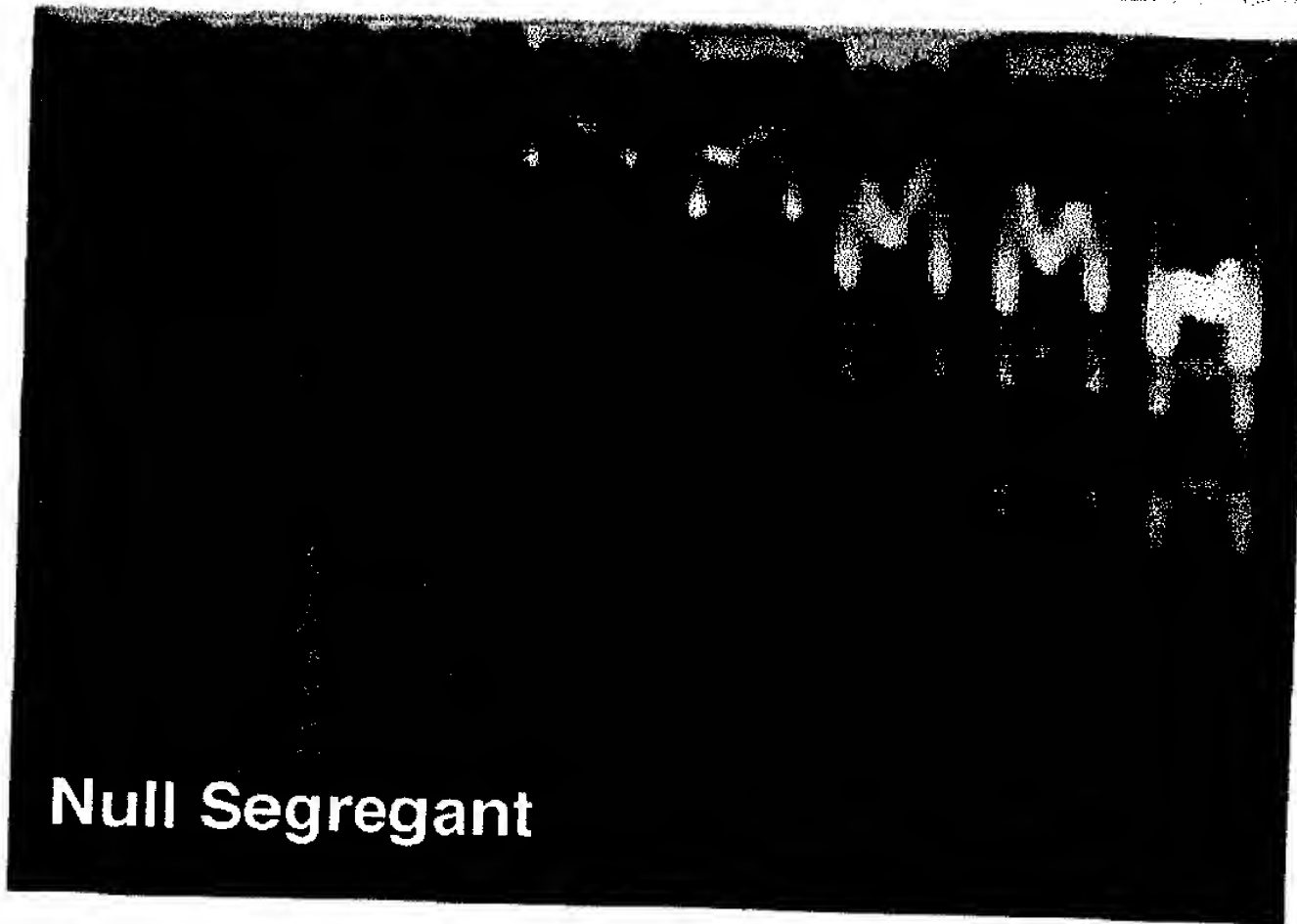
FIGURE 9

Abundance of  
 $\alpha$ -amylases

Total Amylase  
Activity

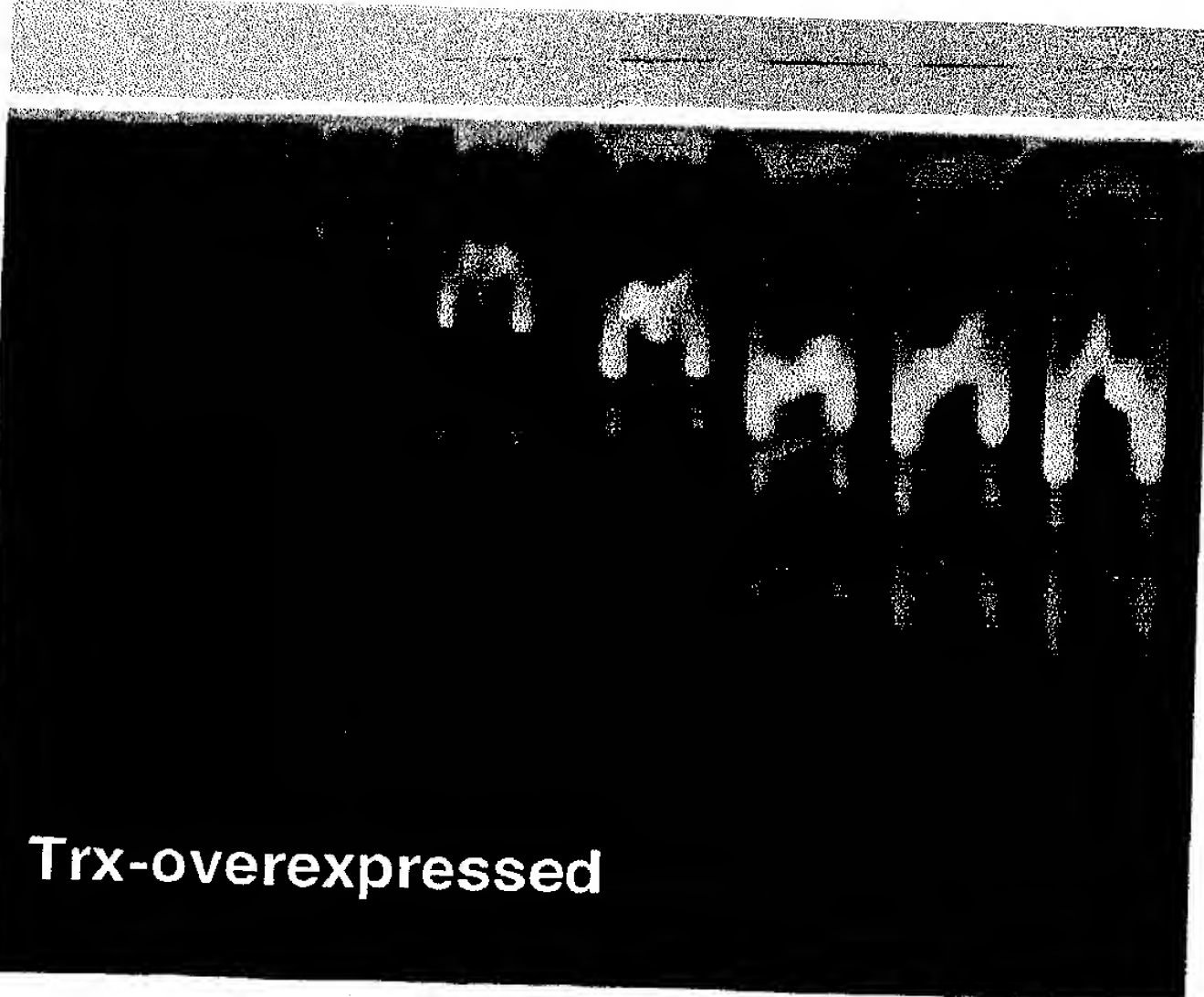
0 1 2 3 4 5 6 7

A



0 1 2 3 4 5 6 7

B



C

D



Figure 10

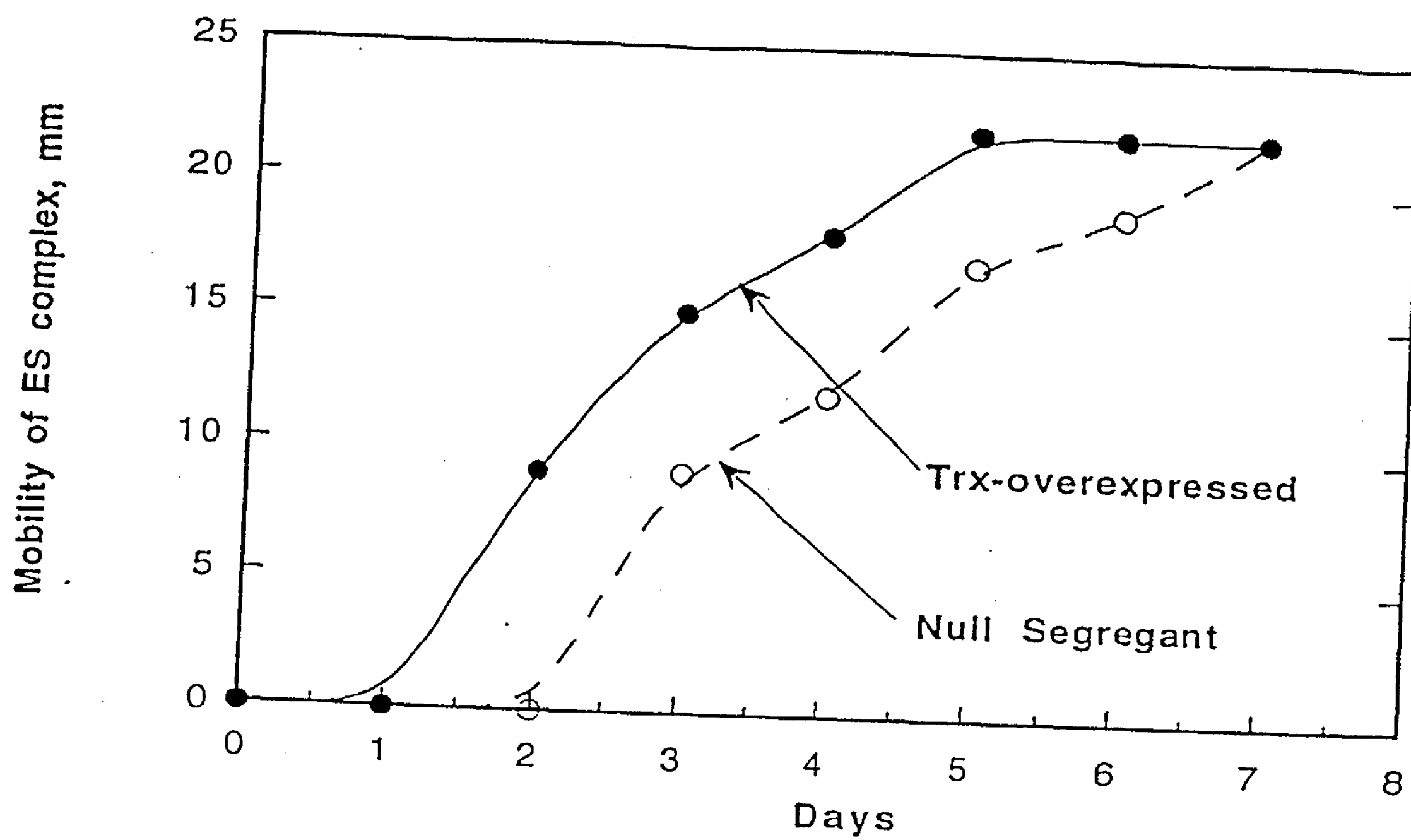


FIGURE 11A

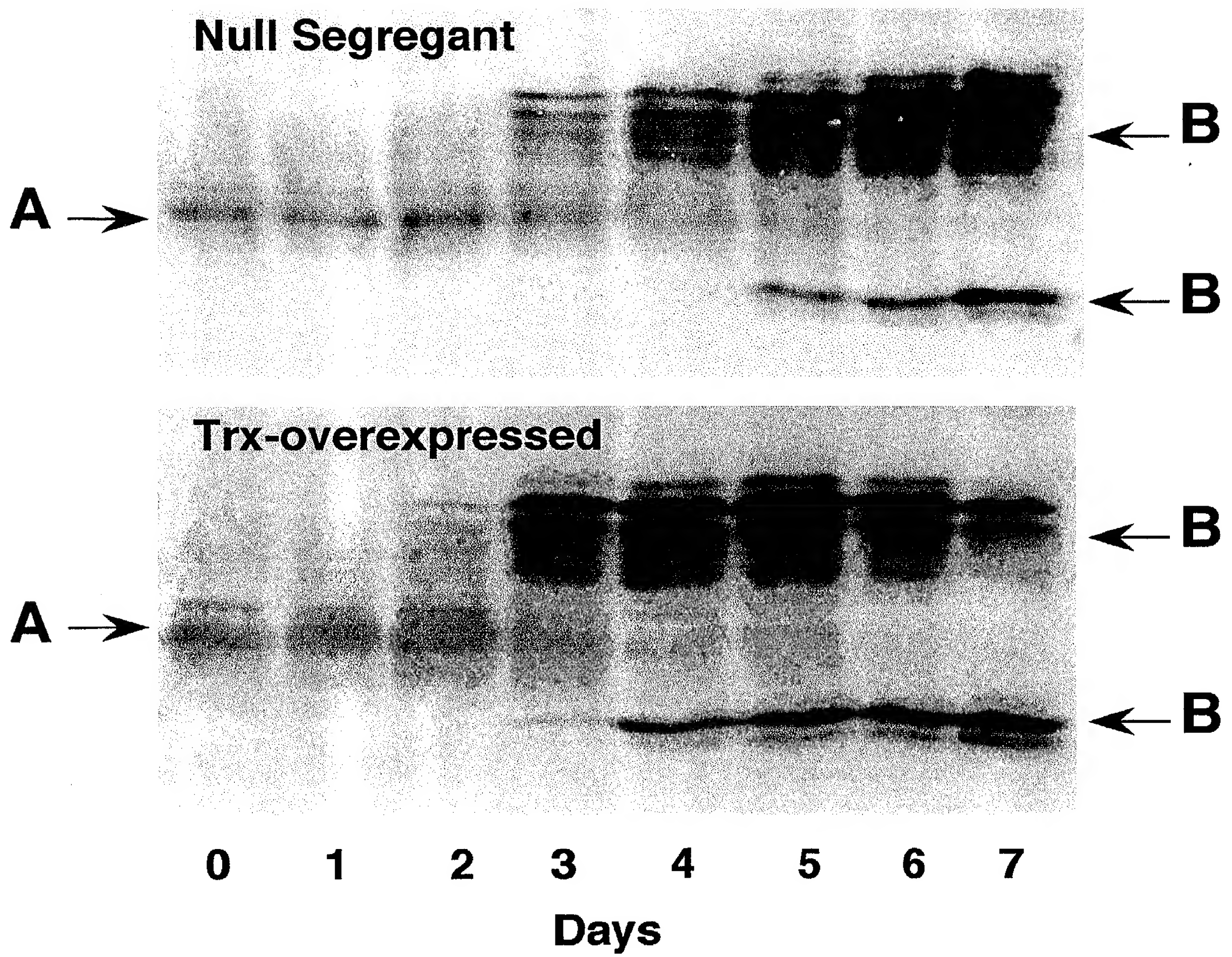


FIGURE 11B

# DNA CONSTRUCTS FOR TRANSFORMATION

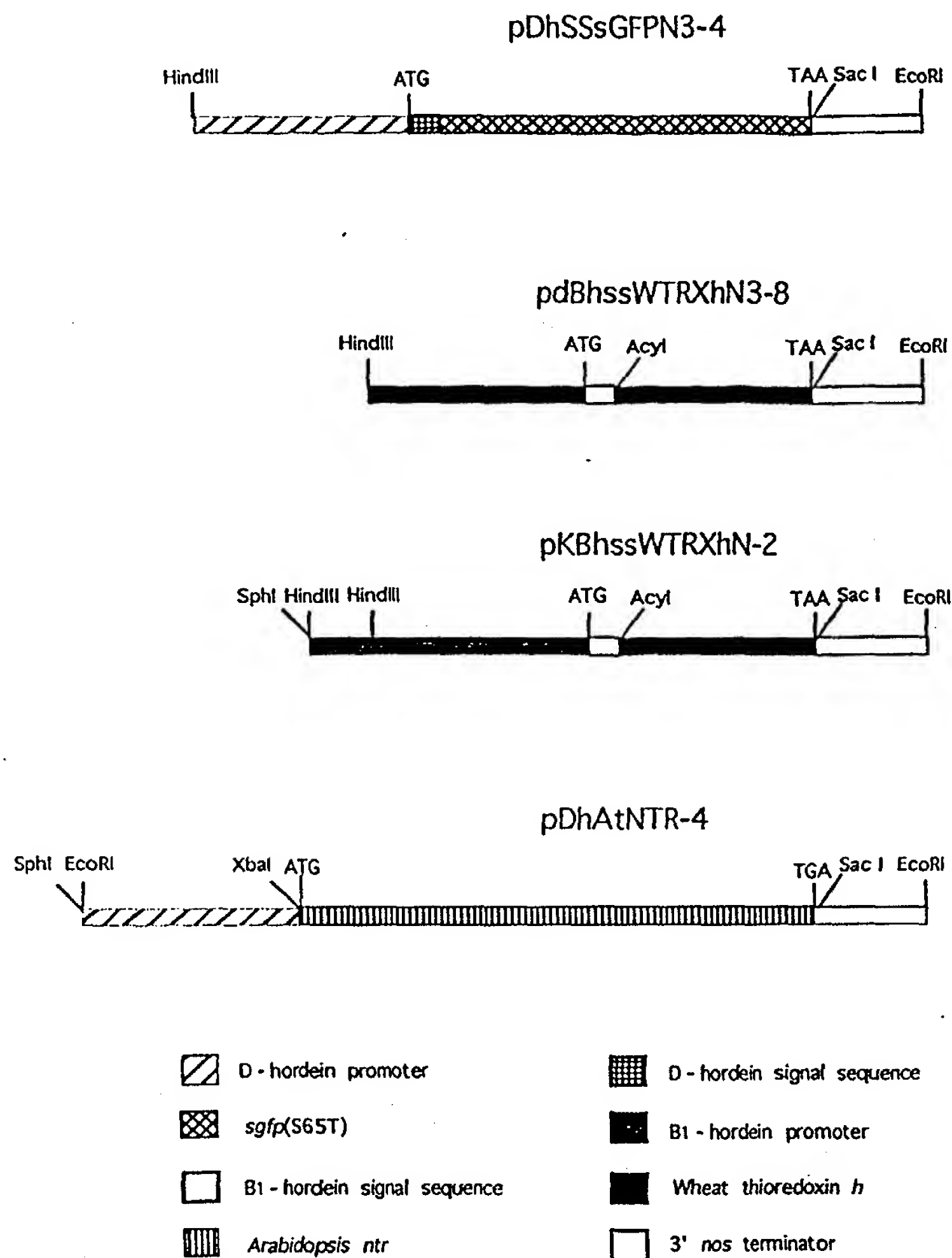
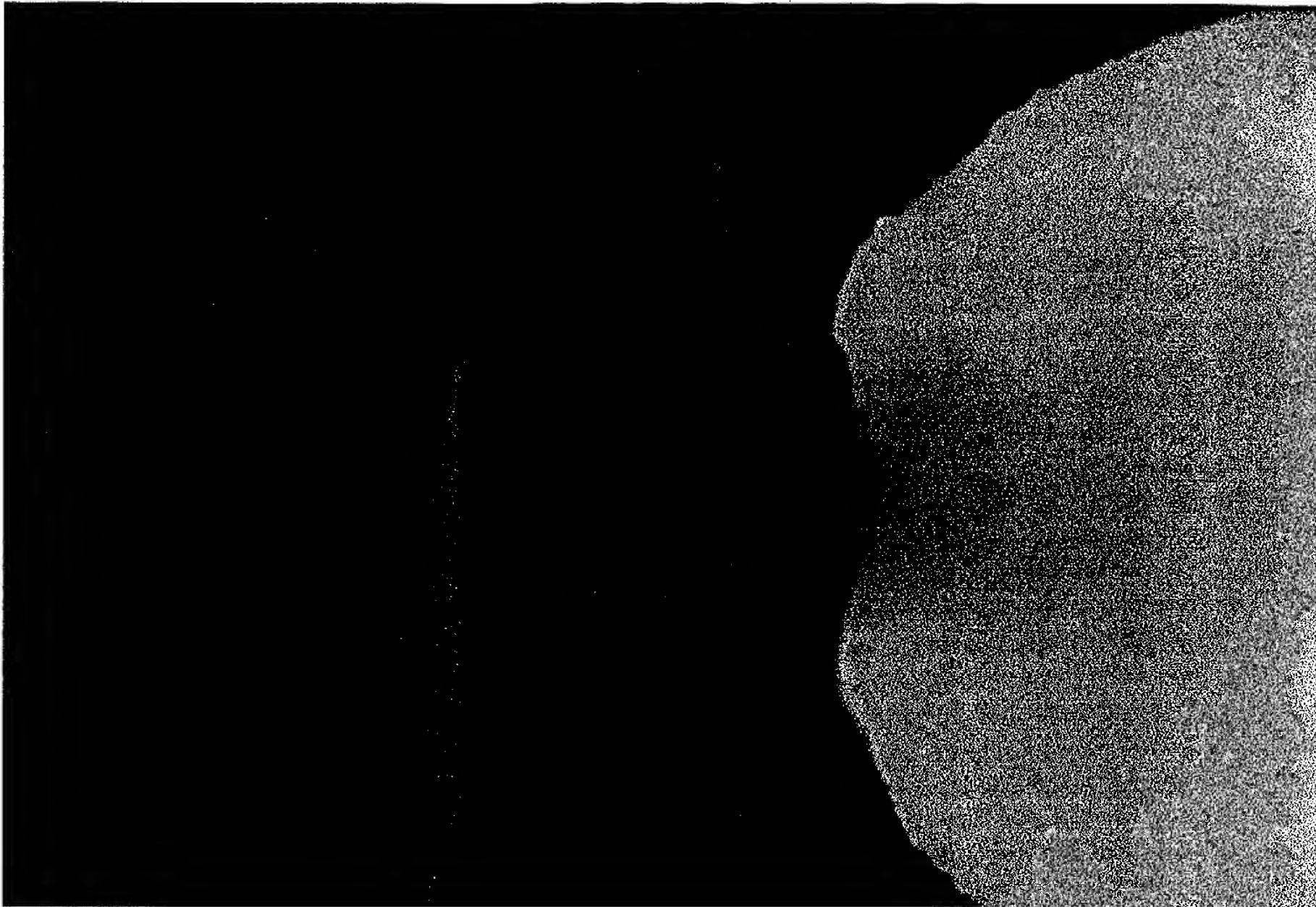


Figure 12

000000 1986 03 00



### Figure 13

100bp ladder

AZHptWTR-1-25-11

AZHptWTR-1-16-1

AZHptWTR-1-16-2

AZHptWTR-1-16-3

AZHptWTR-1-16-4

AZHptWTR-1-16-5

AZHptWTR-1-24-1

AZHptWTR-1-24-2

AZHptWTR-1-24-3

AZHptWTR-1-24-4

AZHptWTR-1-24-5

(+) Control

+

+

+

+

-

+

+

+

+

+

-

0.14-kb  
*wtrxh*

### Figure 14

**A**

Sample
BWHptWtrx-1
BW (nontransgenic)
AZHptWtrx-1
AZHptWtrx-11
AZHptWtrx-21
AZ (nontransgenic)
YRHptWtrx-1
YR (nontransgenic)
Wheat Germ

**B**

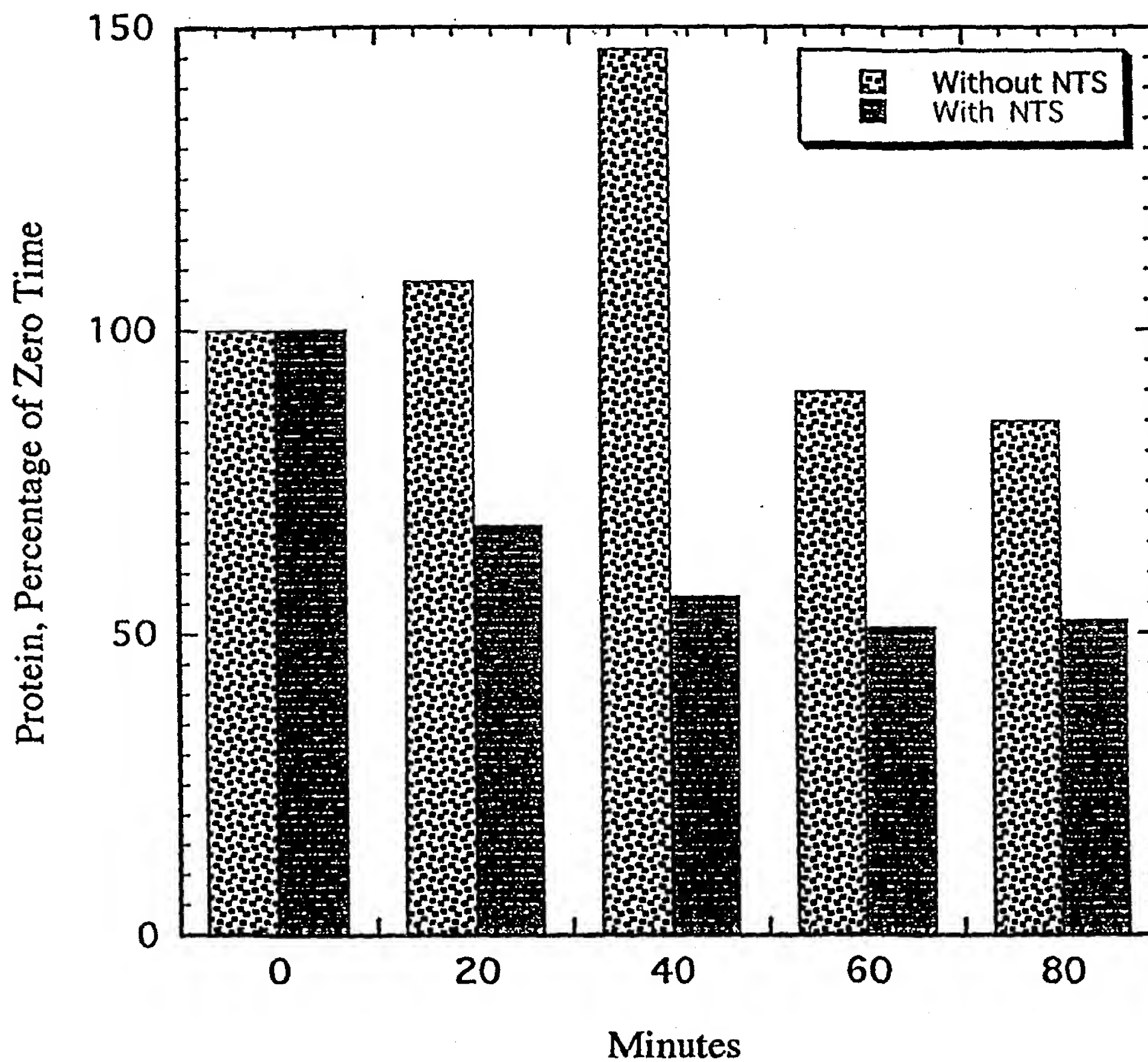
Sample
Wheat Germ
YRHptWtrx-1-2-1
YRHptWtrx-1-2-2
YRHptWtrx-1-2-3
YRHptWtrx-1-1-1
YRHptWtrx-1-1-2
YRHptWtrx-1-1-3
YRHptWtrx-1-1-4
YRHptWtrx-1-1-5
YRHptWtrx-1-1-6
YRHptWtrx-1-1-7
YRHptWtrx-1-1-8
YRHptWtrx-1-1-9

### Figure 15



Figure 16

Effect of Thioredoxin Reduction on Digestion of  
Wheat Glutenins by Trypsin

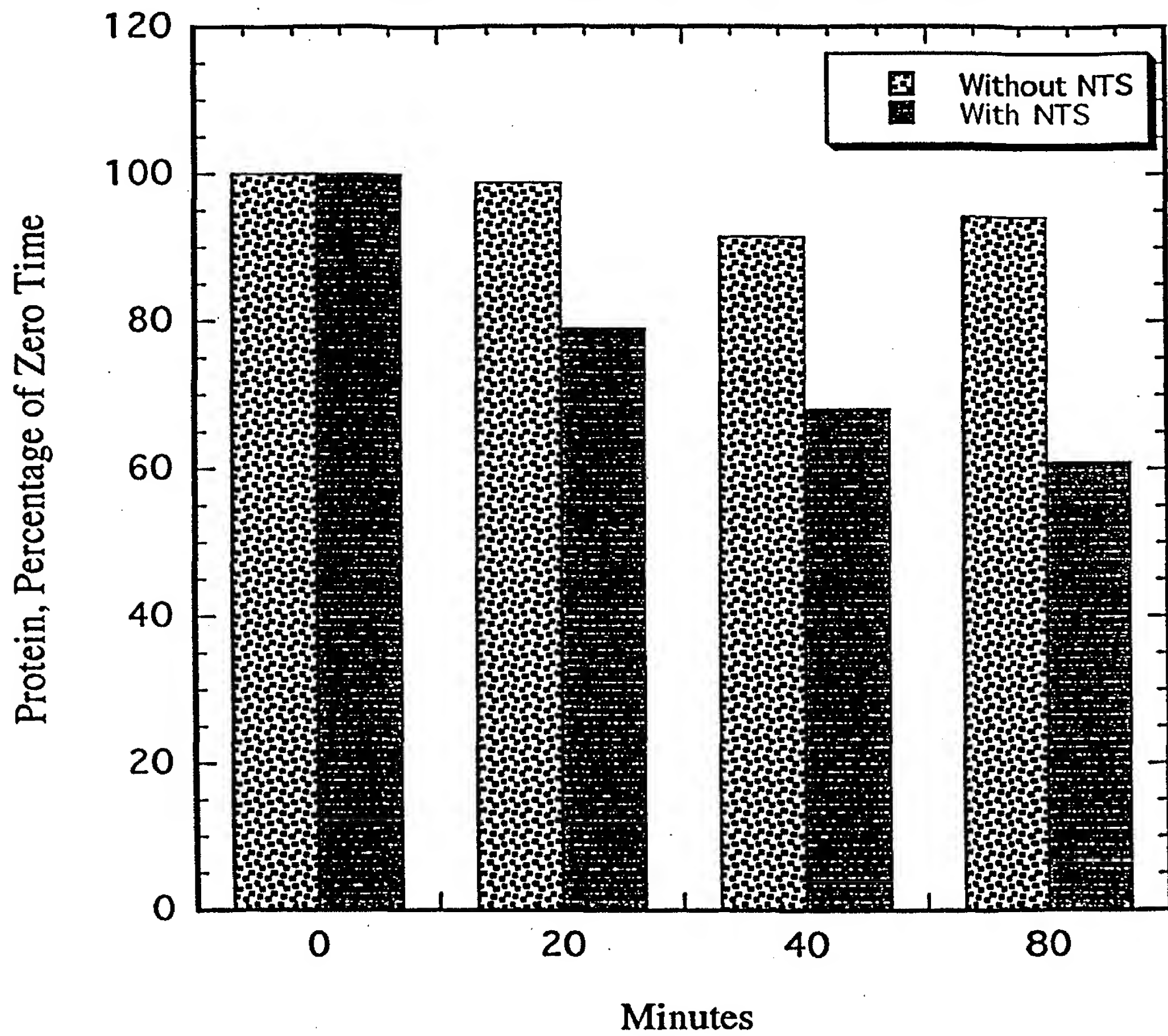


006220 1988E500

00000-1333250

Figure 17

Effect of Thioredoxin Reduction on Digestion of Wheat Glutenins by Pancreatin





Effect of NTR on the Reduction of Proteins in Extracts of Wheat: Transgenic line Over-expressing Thioredoxin h vs. Null Segregant

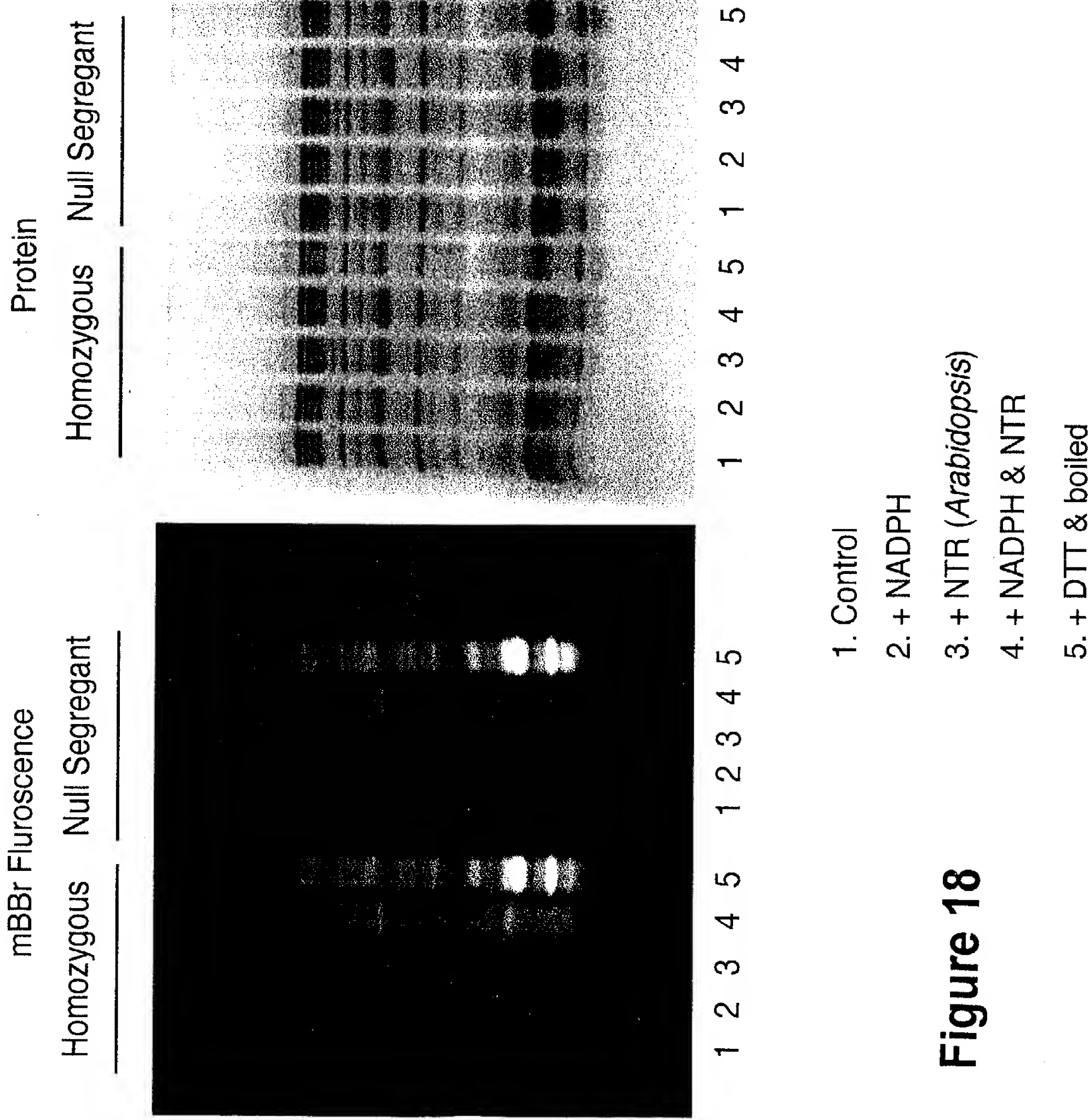
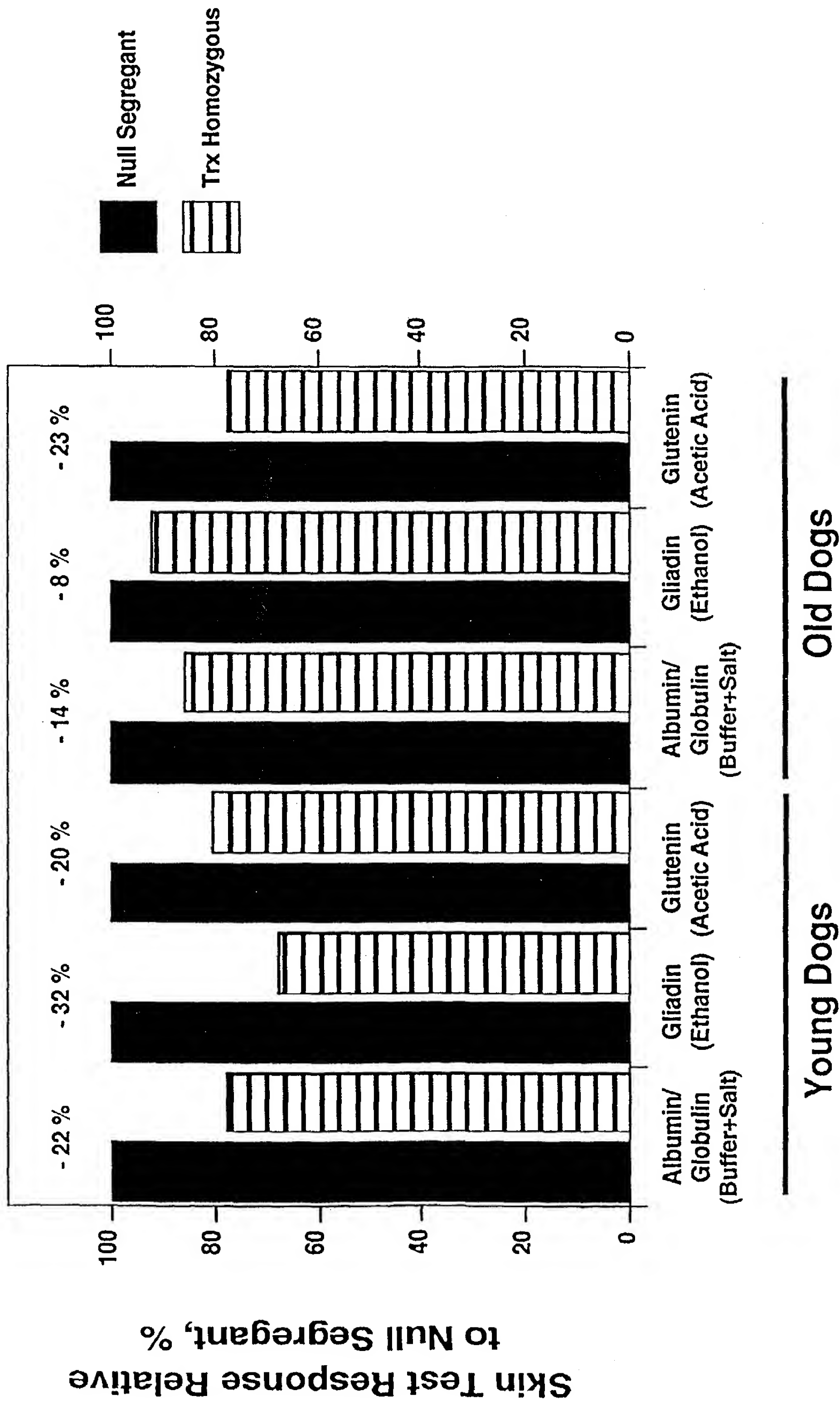


Figure 18

Figure 19

Effect of Overexpressed Thioredoxin *h* on  
Allergenicity of Proteins from Wheat Grain



[illegible][illegible]

FIGURE 21

Percent Germination of Transgenic Barley Grain  
Over-Expressing Wheat Thioredoxin

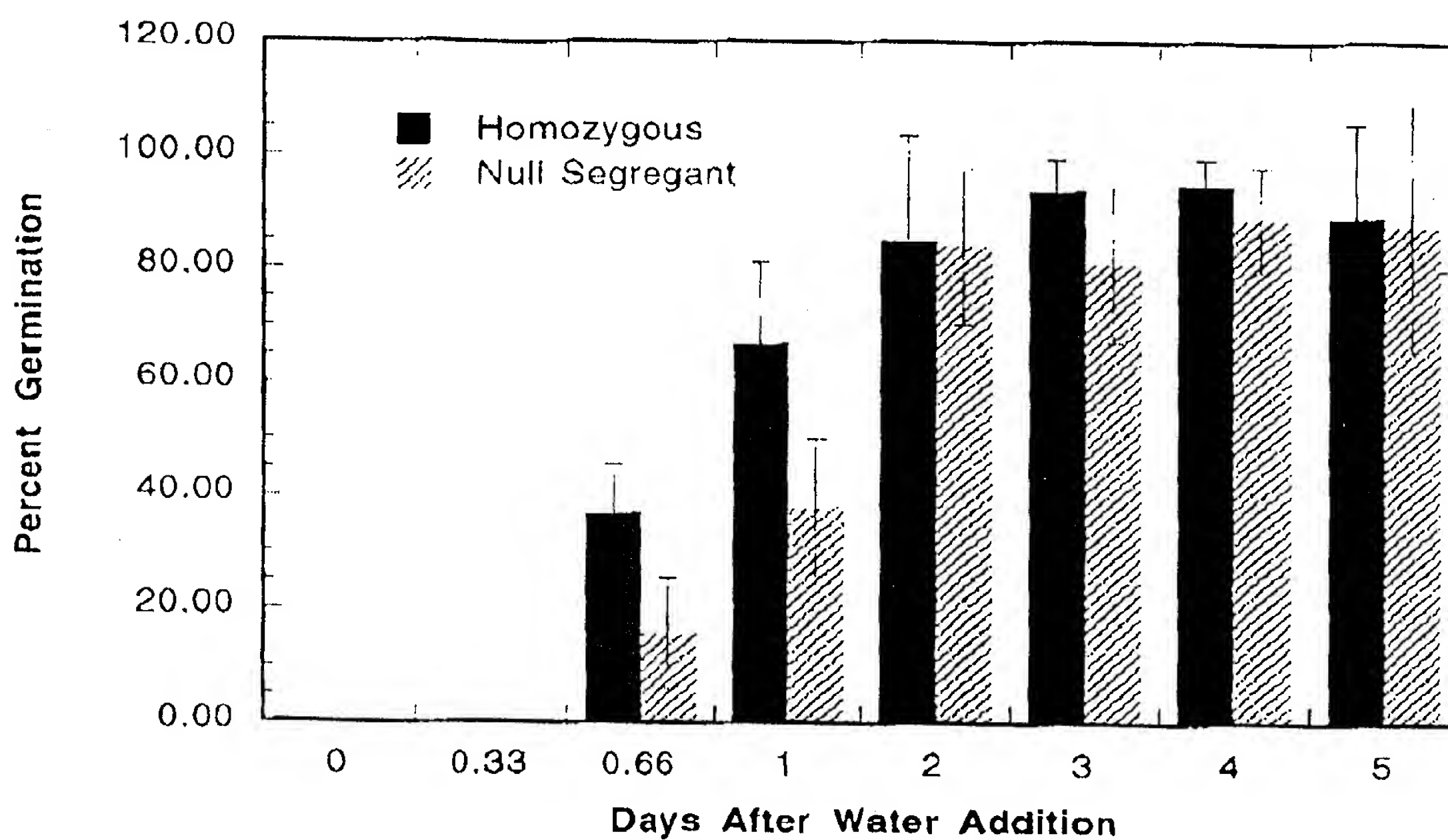
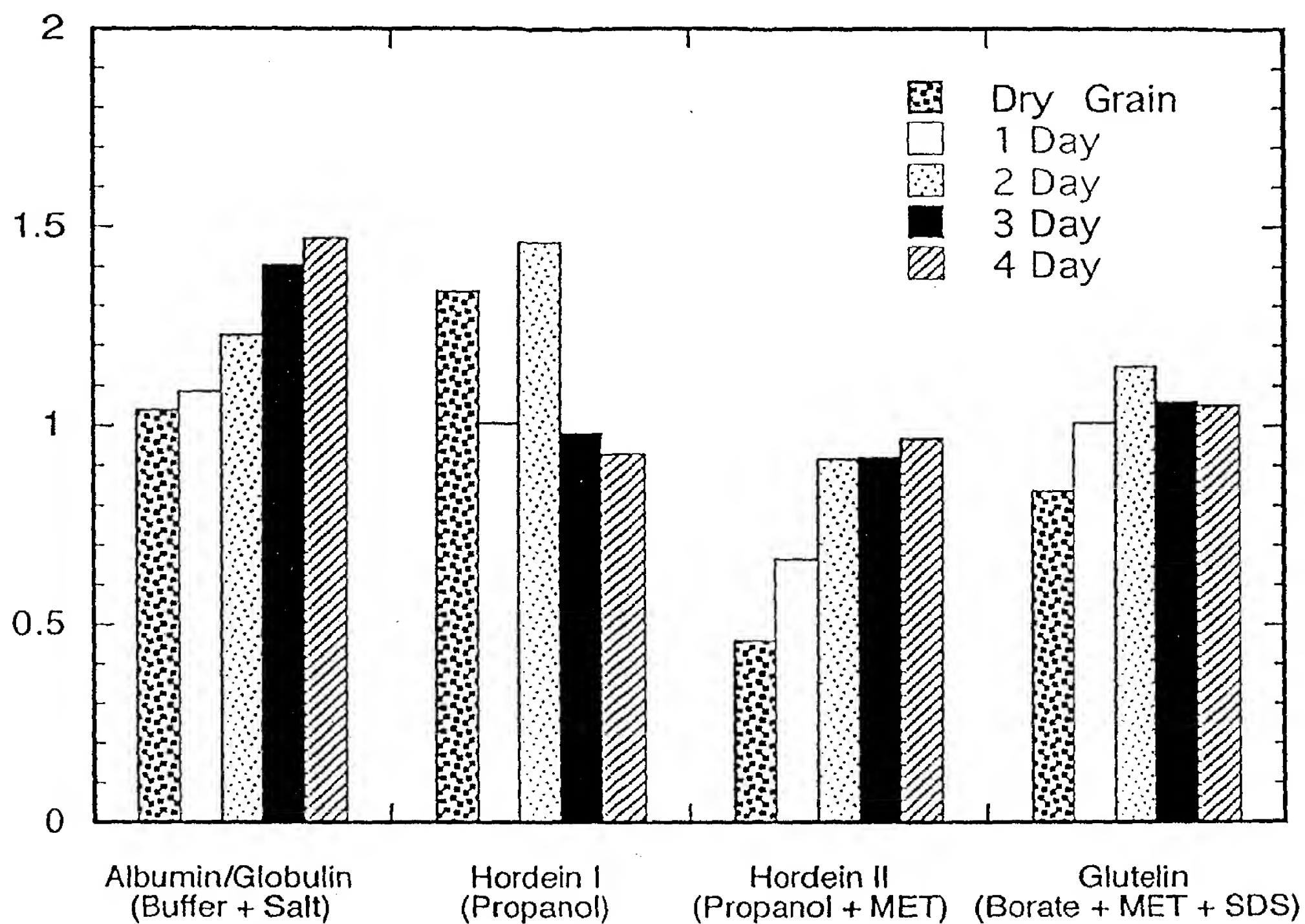


FIGURE 22

Different Relative Redox Status of Protein Fractions  
in Transgenic Barley Grain Over-Expressing  
Wheat Thioredoxin h vs. the Null Segregant:  
Dry and Germinating Grain

Ratio of Relative Reduction,  
(Homozygous:Null Segregant)







Effect of Glucose-6-phosphate Dehydrogenase on the Reduction of  
Proteins in Extracts of Null Segregant Derived from Wheat Grain  
Overexpressing Thioredoxin *h* in the Presence of Glucose 6-  
phosphate and Arabidopsis NTR: +/- NTR

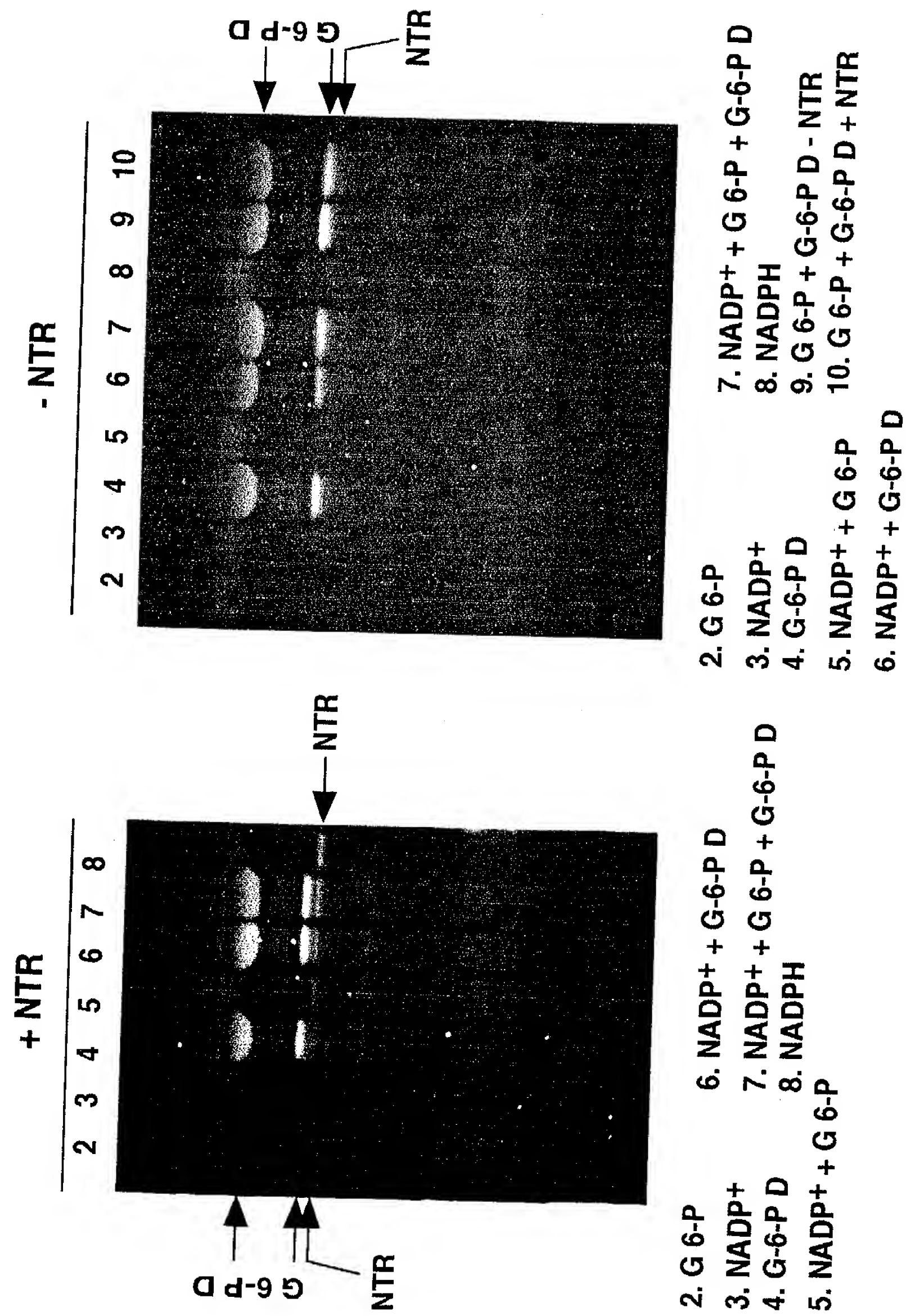


FIGURE 24